IN THE CLAIMS

Please amend the claims as follows:

1.   (Currently Amended) A method for quantizing an audio signal, the method comprising:

~~iteratively incrementing a quantization step size of each scale factor band of a current frame;~~ initializing a quantization step size for each scale factor band of a current frame;

~~comparing a number of bits consumed in quantizing spectral lines in scale factor bands in the current frame to a specified bit rate;~~

determining <u>scale factor bands for which a</u> ~~whether the~~ current quantization step <u>sizes for that</u> ~~in one or more~~ scale factor bands ~~are~~ <u>is</u> at a vanishing point, wherein <u>at least a peak value in that scale factor band remains non-zero after quantizing that scale factor band with the current quantization step size,</u> ~~the vanishing point is a point at which~~ and any further increase in the current quantization step size ~~can~~ <u>will</u> result in ~~a~~ <u>all zero quantized coefficients in that scale factor band</u> ~~value of zero~~; and

freezing ~~the~~ <u>respective</u> quantization step sizes ~~in all~~ <u>for</u> the <u>determined</u> scale factor bands ~~which are~~ at <u>their</u> vanishing points<u>; and</u> ~~and~~

comparing a number of bits consumed in ~~quantizing~~ <u>coding</u> spectral lines in <u>each</u> scale factor band<u>s</u> in the current frame <u>at the current quantization step size</u> to a specified bit rate;

<u>incrementing the quantization step size of each scale factor band of the current frame that are not frozen and repeating steps of determining, freezing, comparing and incrementing, if the number of bits consumed is greater than the specified bit-rate; and</u>

exiting the quantization <u>loop for</u> the current frame when the number of bits consumed is at or below the specified bit rate.

2.   (Original) The method of claim 1, further comprising:

grouping sets of spectral lines to form the scale factor bands in the current frame;

assigning an initial quantization step size to each scale factor band in the current frame; and

quantizing the sets of spectral lines in each scale factor band.

3.   (Canceled)

4.   (Currently Amended) A method for quantizing an audio signal comprising:

determining whether a number of bits consumed in quantizing spectral lines in each scale factor bands in a current frame is at or below a user specified bit rate;

if so, freezing the quantization step sizes in all the scale factor bands and exiting the quantization of the current frame;

if not, incrementing quantization step size of each scale factor band by a predetermined quantization step size;

determining whether the quantization step sizes in one or more scale factor bands are at a vanishing point, wherein at least a peak value in a corresponding scale factor band remains non-zero after quantizing that scale factor band with a current quantization step size, and any further increase in the current quantization step size will result in all zero quantized coefficients in that scale factor band the vanishing point is a point at which any increase in the quantization step size can result in a quantized value of zero; and

if not, repeating the above steps.

5.   (Currently Amended) The method of claim 4, further comprising:

if so, freezing the quantization step sizes of the one or more scale factor bands that are at the vanishing point;

quantizing the spectral lines of remaining scale factor bands in the current frame that are not at the vanishing point;

determining whether a number of bits consumed in quantizing all the spectral lines of the remaining the scale factor bands is at or below the user specified bit rate;

if so, freezing the quantization step sizes in all the remaining scale factor bands and exiting the quantization of the current frame;

if not, incrementing quantization step size of each remaining scale factor band by the predetermined quantization step size;

determining whether the quantization step sizes in one or more of the remaining scale factor bands are at the vanishing point; and

if not, repeating the above steps of determining whether a number of bits, freezing, incrementing and determining whether the quantization step sizes.

6.   (Currently Amended) The method of claim 5, further comprising:

if so, comparing the remaining scale factor bands with a perceptual priority chart;

dropping one or more of the remaining scale factor bands as a function of the comparison;

determining whether the number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate in the current frame;

if so, freezing the quantization step sizes in all the remaining scale factor bands which are at vanishing point and exiting the quantization of the current frame; and

if not, repeating the above steps and of dropping one or more additional scale factor bands as a function of the comparison until the number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate.

7.   (Currently Amended) The method of claim 4, further comprising:

grouping sets of spectral lines to form the scale factor bands in the current frame;

assigning an initial quantization step size to each scale factor band in the current frame; and

quantizing the sets of spectral lines in each scale factor band and determining the number of bits consumed in each scale factor band based on the quantization.

8.   (Canceled)

9.   (Currently Amended) A method for quantizing spectral information in an audio encoder comprising:

assigning an initial quantization step size to each scale factor band in a current frame as a function of a priority chart generated based on a perceptual model;

forming a first perceptual priority chart for the assigned scale factor bands;

determining whether a number of bits consumed in quantizing spectral lines in the scale factor bands in a the current frame is at or below a user specified bit rate;

if so, freezing the quantization step sizes in all the scale factor bands and exiting the quantization of the current frame;

if not, incrementing the quantization step size of each scale factor band based on the first perceptual priority chart;

determining whether the quantization step sizes in one or more scale factor bands are at a vanishing point, wherein at least a peak value in a scale factor band remains non-zero after quantizing that scale factor band with a current quantization step size, and any further increase in the current quantization step size will result in all zero quantized coefficients in that scale factor band the vanishing point is a point at which any increase in the quantization step size can result in a quantized value of zero; and

if not, repeating the above steps.

10. (Currently Amended) The method of claim 9, further comprising:

if so, freezing the quantization step sizes of the one or more scale factor bands that are at the vanishing point;

forming a second perceptual priority chart by removing the one or more scale factor bands that are at the vanishing point from the first perceptual priority chart;

quantizing spectral lines of remaining scale factor bands that are not at the vanishing point and determining a number of bits consumed in the remaining scale factor bands based on the quantization;

determining whether the number of bits consumed in quantizing all spectral lines of the remaining scale factor bands is at or below the user specified bit rate;

if so, freezing the quantization step sizes in all the remaining scale factor bands and exiting the quantization of the current frame;

if not, incrementing quantization step size of each remaining scale factor band based on the second perceptual priority chart;

determining whether all the remaining scale factor bands are at the vanishing point; and

if not, repeating the above steps of determining whether the number of bits consumed, freezing the quantization step sizes, incrementing quantization step size, and determining whether all the remaining scale factor bands.

11.   (Currently Amended) The method of claim 10, further comprising:

if so, comparing the remaining scale factor bands with the first perceptual priority chart;

dropping one or more of the remaining scale factor bands having lower perceptual priority as a function of the comparison;

determining whether the number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate in the current frame;

if so, freezing the quantization step sizes of all the remaining scale factor bands and exiting the quantization of the current frame; and

if not, repeating the above steps and of dropping one or more additional scale factor bands as a function of the comparison until the number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate.

12.   (Currently Amended) An article comprising:

a storage medium having instructions that, when executed by a computing platform, result in execution of a method comprising:

determining whether a number of bits consumed in quantizing spectral lines in each scale factor bands is at or below a user specified bit rate in a current frame;

if so, freezing the quantization step sizes in all the scale factor bands and exiting the quantization of the current frame;

if not, incrementing quantization step size of each scale factor band by a predetermined quantization step size;

determining whether one or more scale factor bands is at a vanishing point, wherein at least a peak value in a corresponding scale factor band remains non-zero after quantizing that scale factor band with a current quantization step size, and any further increase in the current quantization step size will result in all zero quantized coefficients in that scale factor band

~~wherein the vanishing point is a point at which any increase in the quantization step size can~~ ~~result in a quantized value of zero~~; and

if not, repeating the above steps.

13.   (Currently Amended) The article of claim 12, further comprising:

if so, freezing the quantization step sizes of the one or more scale factor bands that are at the vanishing point;

quantizing spectral lines of remaining scale factor bands <u>in the current frame</u> that are not at the vanishing point;

determining whether <u>a</u> number of bits consumed in <u>quantizing all the spectral lines of the</u> <u>remaining</u> ~~the~~ scale factor bands is at or below the user specified bit rate;

if so, freezing the quantization step sizes in all the remaining scale factor bands and exiting the quantization of the current frame;

if not, incrementing quantization step size of each remaining scale factor band by the predetermined quantization step size;

determining whether all the remaining scale factor bands are at the vanishing point; and

if not, repeating the above steps <u>of determining whether the number of bits consumed,</u> <u>freezing the quantization step sizes, incrementing quantization step size, and determining</u> <u>whether all the remaining scale factor bands</u>.

14.   (Currently Amended) The article of claim 13, further comprising:

if so, comparing the scale factor bands with a perceptual priority chart;

dropping one or more of the scale factor bands as a function of the comparison;

determining whether <u>the</u> number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate in the current frame;

if so, freezing the quantization step sizes of all the remaining scale factor bands <u>and</u> <u>exiting the quantization of the current frame</u>; and

if not, repeating the above steps ~~and~~ <u>of</u> dropping additional scale factor bands as a function of the comparison until the number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate.

15.   (Currently Amended) An audio coder comprising:

an input module partitions an audio signal into a sequence of successive frames;

a time-to-frequency transformation module obtains the spectral lines in each frame and forms critical bands by grouping sets of neighboring spectral lines; and

an encoder coupled to the time-to-frequency module, wherein the encoder further comprises:

an inner loop module determines whether a number of bits consumed in each critical band is at or below a user specified bit rate in a current frame, wherein the inner loop module freezes quantization step sizes in all the critical bands when the number of bits consumed is at or below the user specified bit rate; and

an outer loop module increments quantization step sizes of each critical band by a predetermined quantization step size when the number of bits consumed is above the user specified bit rate, and ~~wherein the outer loop module increments quantization step sizes and~~ determines whether the quantization step sizes in one or more critical bands are at the vanishing point, wherein at least a peak value in a scale factor band remains non-zero after quantizing that scale factor band with a current quantization step size, and any further increase in the current quantization step size will result in all zero quantized coefficients in that scale factor band ~~wherein the vanishing point is a point at which any increase in the quantization step size can result in a quantized value of zero~~, and wherein the outer loop module freezes the quantization step sizes of the one or more critical bands that are at the vanishing point.

16.   (Currently Amended) The audio coder of claim 15, wherein the outer loop module quantizes spectral lines of remaining critical bands that are not at the vanishing point, wherein the inner loop module determines whether a number of bits consumed by the remaining critical bands is at or below the user specified bit rate, wherein the outer loop module freezes the quantization step sizes in all the remaining critical bands and exits quantization of the current frame, wherein the outer loop module increments quantization step sizes of the remaining critical bands by the predetermined quantization step size, wherein the outer loop module determines

whether the remaining critical bands are at the vanishing point, and wherein the outer loop
module increments quantization step sizes until the user specified bit rate is met when none of
the remaining critical bands are not at the vanishing point.

17.   (Currently Amended) The audio coder of claim 16, wherein the outer loop module
compares the remaining critical bands with a perceptual priority chart when all the critical bands
are at the vanishing point, wherein the outer loop module drops the one or more of the critical
bands having a lower perceptual quality as a function of the comparison, wherein the inner loop
module determines whether the number of bits consumed by the spectral lines in the remaining
critical bands is at or below the user specified bit rate in the current frame, wherein the outer
loop module freezes the quantization step sizes of all the remaining critical bands when the
number of bits consumed by the remaining critical bands is at or below the user specified bit rate
and exits the quantization of the current frame, and wherein the outer loop module drops one or
more critical bands until the user specified bit rate is met when the number of bits consumed by
the remaining critical bands are above the user specified bit rate.

18.   (Currently Amended) A system comprising:

        a bus;

        a processor coupled to the bus;

        a memory coupled to the processor;

        a network interface coupled to the processor and the memory; and

        an audio coder coupled to the network interface and the processor, wherein the audio
coder further comprises:

        an input module partitions an audio signal into a sequence of successive frames;

        a time-to-frequency transformation module obtains the spectral lines in each frame and
forms critical bands by grouping sets of neighboring spectral lines; and

        an encoder coupled to the time-to-frequency module, wherein the encoder further
comprises:

                an inner loop module determines whether a number of bits consumed in
        quantizing spectral lines in each scale factor band is at or below a user specified bit rate

in a current frame, wherein the inner loop module freezes quantization step sizes in all the

critical bands when the number of bits consumed is at or below the user specified bit rate;

and

        an outer loop module increments quantization step sizes of each critical

band by a predetermined quantization step size when the number of bits consumed is

above the user specified bit rate, wherein the outer loop module determines whether one

or more critical bands are at a vanishing point, <u>wherein at least a peak value in a scale</u>

<u>factor band remains non-zero after quantizing that scale factor band with a current quantization</u>

<u>step size, and any further increase in the current quantization step size will result in all zero</u>

<u>quantized coefficients in that scale factor band</u> ~~wherein the vanishing point is a point at~~

      ~~which any increase in the quantization step size can result in a quantized value of zero,~~

and wherein the outer loop module freezes the quantization step sizes of the one or more

critical bands that are at the vanishing point.

19.   (Currently Amended) The system of claim 18, wherein the outer loop module quantizes

spectral lines of remaining critical bands <u>in the current frame</u> that are not at the vanishing point,

wherein the inner loop module determines whether <u>a</u> number of bits consumed in quantizing the

spectral lines in the <u>remaining</u> critical bands is at or below the user specified bit rate, wherein the

outer loop module freezes the quantization step sizes in all the remaining critical bands and exits

quantization of the current frame when the number of bits consumed in quantizing the critical

bands is at or below the user specified bit rate, wherein the outer loop module increments

quantization step sizes of the remaining critical bands by the predetermined quantization step

size, wherein the outer loop module determines whether all the remaining critical bands are at the

vanishing point, and wherein the outer loop module increments quantization step sizes until the

user specified bit rate is met when none of the remaining critical bands are not at the vanishing

point.

20.   (Currently Amended) The system of claim 19, wherein the outer loop module compares

the remaining critical bands with a perceptual priority chart when all the critical bands are at the

vanishing point, wherein the outer loop module drops the one or more critical bands having a

lower perceptual quality as a function of the comparison, wherein the inner loop module determines whether the number of bits consumed by the spectral lines in the remaining critical bands is at or below the user specified bit rate in the current frame, wherein the outer loop module freezes the quantization step sizes of all the remaining critical bands when the number of bits consumed by the remaining critical bands is at or below the user specified bit rate and exits the quantization of the current frame, and wherein the outer loop module drops one or more critical bands until the user specified bit rate is met when the number of bits consumed by the remaining critical bands are above the user specified bit rate.

21.   (Currently Amended) An apparatus for encoding an audio signal, comprising:
        means for partitioning an audio signal into a sequence of successive frames;
        means for obtaining the spectral lines in each frame and forming critical bands by grouping sets of neighboring spectral lines; and
        means for quantizing critical bands, wherein the means for quantizing further comprises:
                means for determining whether a number of bits consumed by the spectral lines in the critical bands is at or below a user specified bit rate in a current frame, and wherein the means for determining whether the number of bits consumed by the spectral lines in the critical bands is at or below the user specified bit rate freezes quantization step sizes in all the critical bands when the number of bits consumed is at or below the user specified bit rate; and
                means for incrementing quantization step size of each critical band by a predetermined quantization step size when the number of bits consumed is above the user specified bit rate, and wherein the means for incrementing quantization step size of each critical band determines whether one or more critical bands are at a vanishing point, wherein at least a peak value in a scale factor band remains non-zero after quantizing that scale factor band with a current quantization step size, and any further increase in the current quantization step size will result in all zero quantized coefficients in that scale factor band wherein the vanishing point is a point at which any increase in the quantization step size can result in a quantized value of zero.

22.   (Canceled)